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ABSTRACT

According to data obtained for the year 1978 from the Fatal Accident Reporting System (FARS) and from state governments under contract to the National Highway Traffic Safety Administration, teenaged drivers (especially males) have much higher rates of fatal crash involvement than older drivers. In addition, teenaged drivers are more likely than their older counterparts to be responsible for the crash. Also noteworthy is the fact that the deaths that teenagers are responsible for occur disproportionately to people other than themselves. Since past policies aimed at producing drivers who are less likely to crash (including use of education, restrictive licensing practices, enforcement of laws pertaining to vehicle operation, and suspension or rehabilitation of drivers with crashes or violations) have had only limited success, other more effective policies are needed. Most likely, the deaths resulting from teenagers' driving could be more effectively reduced by adopting policies that reduce their exposure as drivers and by ensuring that long-proven automatic injury-reduction technologies become standard in all motor vehicles. (MN)

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Teenaged Drivers and Fatal Crash Responsibility

Preliminary Report

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Abstract

Teenaged drivers, especially males, have much higher rates of fatal crash involvement than older drivers. Data presented in this paper show the following:

- Young drivers up to about age 25, especially 16 and 17 year olds, are more often responsible for their fatal crashes and resulting deaths than are older drivers. Young male drivers are more likely than young females to be responsible for their fatal crashes.
- Teenaged drivers are responsible for more deaths per license holder than drivers of all other ages; they are responsible for about five times as many crash deaths per license holder as drivers aged 35-64.
- Teenaged male drivers have by far the highest rates of involvement in crash deaths, and deaths for which they are responsible. Per license holder, male teenaged drivers kill more than four times as many people as female teenaged drivers.
- Male teenaged drivers were involved in 84 percent of the 6,086 1978 passenger vehicle occupant deaths studied for which teenagers were probably responsible. Female teenagers accounted for 16 percent.
- Teenaged drivers more often kill other people than themselves. For example, more than half the people killed by teenagers in 1978 were their own passengers, or drivers and passengers in other vehicles, whereas the majority of people killed by drivers aged 21 or older were themselves.

Teenaged drivers have much higher rates of fatal crash involvement than older drivers. As drivers of passenger vehicles (automobiles, pickup trucks, and vans), their fatal crash rates per license holder are substantially higher than the rates for drivers in their twenties, and more than double the rates of drivers age 30 and older (Karpf and Williams, 1982). Male teenagers have especially high fatal crash rates. This paper presents an analysis of the probable responsibility of drivers for fatal crashes, in relation to their ages and sex.

Methods and Data Sources

Information on fatal passenger vehicle crashes was obtained from the Fatal Accident Reporting System (FARS) for the year 1978. FARS is a computerized data base containing information on virtually all motor vehicle fatalities in the United States. The data are collected by the state governments under contract to the National Highway Traffic Safety Administration (1978). In the present study, crashes with occupant fatalities involving a single passenger vehicle, or two passenger vehicles only, were studied. Fatal crashes involving motorcycles, large trucks, bicycles, pedestrians, or more than two passenger vehicles were excluded.

For each crash, the probable responsibility of each driver was determined. Drivers in crashes involving only their own vehicle were assumed to have been responsible for the crash. In crashes involving two passenger vehicles, the FARS code, "Related Factors, Driver Level," was used to assign probable crash responsibility (National Highway Traffic Safety Administration, 1978). This code is based on the narrative

description of the crash provided by the investigating police officer. The code lists 33 driver actions and nine driver conditions that may have contributed to the crash. If any of these 42 was attributed to a driver, that driver was considered to have probable responsibility for the crash. (It is recognized that this procedure for assigning probable responsibility for single and two-vehicle crashes arbitrarily eliminates, for the purpose of this analysis, the contribution of environmental and vehicle factors to the initiation of the fatal crashes tabulated.)

Results

In 1978, there were 15,077 fatal single passenger vehicle crashes, resulting in 16,712 deaths, and 9,191 fatal two passenger-vehicle crashes that resulted in 11,574 deaths. These 28,286 deaths accounted for 81 percent of all passenger vehicle occupant deaths that occurred in 1978.

The 14 driver actions and conditions most frequently cited in two-vehicle collisions in the present study are rank ordered in Table 1. They accounted for 97 percent of the total. Crash responsibility for each driver in a two-vehicle crash was assigned independently. In the great majority of crashes, however, only one driver was thought to be responsible (Table 2).

Figures 1 and 2, and Table 3, present data on probable responsibility for fatal crashes, in relation to driver age and sex.* Figure 1 shows that teenaged drivers in two-vehicle fatal crashes were

* Because of the small numbers involved, data on drivers less than age 16 are not presented in these and subsequent figures and tables.

more likely than older drivers (except the very elderly) to be probably responsible for the crashes, and more likely than drivers of all ages to be probably responsible when single and two-vehicle crashes are combined. More than 75 percent of drivers aged 25 or less and 70 or older were probably responsible for the fatal crashes in which they were involved. In the case of two-vehicle fatal crashes, 50 percent or more of drivers aged 26 or less and 60 or older were probably responsible. Among young drivers, 16 year olds were most likely to be responsible, followed by 17 year olds. Seventy percent of the 479 sixteen year olds in fatal two-vehicle crashes in 1978, and 86 percent of the 1,011 16 year olds in single and two-vehicle fatal crashes, were thought to be responsible for the crashes.

Figure 2 shows that there are marked differences in probable crash responsibility in relation to driver sex. Among young drivers, men were more likely than women to be probably responsible for their fatal crashes, up to about age 35 in the case of two-vehicle crashes, and to about age 55 in the combined set of fatal crashes. Among elderly drivers, women were more likely than men to be probably responsible. Sixteen and 17 year old males had the highest responsibility rates among young male drivers; 16 and 17 year old females had the highest rates among young female drivers.

Sixteen year old males were the most likely of all drivers to be probably responsible for the fatal passenger vehicle crashes in which they were involved. In two-vehicle crashes in which only one driver was thought to be responsible, 16 year old males were the responsible drivers in the majority of their crashes with vehicles driven by drivers of every other age, through age 68 (Figure 3). For example, in crashes with

drivers 28 - 55 years old, 16 year old males were probably responsible in more than 75 percent of the crashes.

When the numbers of deaths are considered according to the driver's probable crash responsibility, teenaged drivers are responsible for higher proportions of the deaths in crashes in which they are involved than are older drivers. Figure 4 and Table 4 show the deaths male and female drivers of each age were probably responsible for, as a percent of all deaths in crashes (single vehicle, and two-vehicle crashes with only one responsible driver) involving drivers of that age and sex. Male drivers aged 16-56 were probably responsible for higher proportions of the deaths in their crashes than were female drivers; at older ages, female drivers were more likely than males to be probably responsible for the deaths in their crashes. Sixteen and 17 year old drivers were probably responsible for the highest proportions of occupant deaths in the passenger vehicle crashes studied in which they were involved in 1978. Male 16 and 17 year old drivers were probably responsible for 86 percent of the 2,425 deaths in their crashes; female 16 and 17 year olds for 78 percent of 568 deaths.

Figures 5 and 6 plot the numerators and denominators of Figure 4 on a per license holder basis, for males and females, respectively, and Table 5 presents these rates. The figures show the greatly disproportionate contribution of teenaged drivers to both crash deaths, and deaths for which they are probably responsible, in comparison with drivers of all other ages. Based on males and females combined, teenagers are responsible for about five times as many crash deaths per license

holder as drivers aged 35-64. Although elderly drivers rival teenagers in the extent to which they are probably responsible for the fatal crashes in which they are involved (see Figure 1), they are involved in many fewer fatal crashes. The numbers of deaths per license holder that the drivers were not responsible for vary less with driver age than do the rates for deaths drivers are responsible for, for both males and females (the unshaded difference between the lines in Figures 4 and 5).

Teenaged male drivers have by far the highest rates of involvement in crash deaths for which they are probably responsible. Their rates per license holder are four to five times those of female teenaged drivers. In addition, there is a greater differential between the rates of teenaged males and older male drivers than between teenaged females and older female drivers. Of the 6,086 1978 passenger vehicle occupant deaths studied for which 16-19 year old drivers were probably responsible, male drivers were involved in 84 percent, female drivers in 16 percent.

Figure 7 shows that among the deaths that drivers were thought to be responsible for, teenaged drivers - especially 16-18 year olds - were more often responsible for the deaths of others rather than themselves. This occurs in part because teenaged drivers carry more passengers than other drivers, (Gloyns et al., 1982) and because they have higher injury thresholds and more favorable clinical courses than elderly drivers. More than half the deaths for which teenaged drivers were probably responsible were sustained by their own passengers, or by drivers and passengers in other vehicles. This percentage declined with age; the majority of deaths for which drivers aged 21 or older were probably responsible were their own.

Discussion

It is well known that young drivers less than about 25 years old - especially teenaged drivers - are disproportionately involved in fatal crashes. The data presented in this paper show another way in which young drivers contribute more than older drivers to motor vehicle injuries. That is, in fatal crashes in which they are involved, they are more likely than older drivers to be responsible for the crash. It is particularly noteworthy that the deaths teenagers are responsible for occur disproportionately to people other than themselves. This greater tendency for young drivers to be "at fault" or responsible for crashes has also been reported in other studies based on both fatal and nonfatal crashes (Harrington, 1971; Organisation for Economic Co-operation and Development, 1975).

The bulk of the problem related to young drivers is due to males, especially teenagers. They have much higher fatal crash rates than females, and are more likely to be responsible for their crashes and the resulting deaths. Although the reasons for the greater likelihood of young males to be responsible for their fatal crashes are not fully known, they are probably more aggressive drivers than females, and they are more likely to drive after consuming alcohol and/or other drugs (Jones and Joscelyn, 1978).

Attempts to reduce the deaths associated with the driving of teenagers have relied largely on policies aimed at producing drivers who are less likely to crash. These policies have included use of education, restrictive licensing practices, enforcement of laws pertaining to

vehicle operation, and suspension or rehabilitation of drivers with crashes or violations. These policies have at best had only limited success (Robertson, 1981).

Another approach to reducing the deaths associated with teenagers driving is to reduce their exposure. For example, an unexpected byproduct of the elimination of state funding for driver education in Connecticut was a reduction in the percent of the 16 and 17 year old population obtaining driver licenses, which in turn greatly reduced their per capita crash involvement (Robertson, 1980). Several states have "night curfews" that prohibit some teenagers from driving during some late evening/early morning hours during which many of the crashes of teenagers occur. Some states have considered raising the minimum driving age to 17 or 18. Presently, the minimum driving age in most states is 16; a few allow driving at age 15. Only one state (New Jersey) does not allow driving for most teenagers until age 17. Studies by the Insurance Institute for Highway Safety are currently under way to determine the effect of existing night curfew regulations, and the effect of delaying licensure until age 17.

The countermeasures that have been discussed thus far are intended to reduce crashes. It should be emphasized that the "bottom line" is the reduction of the frequency and severity of motor vehicle injuries, which can also be substantially accomplished in ways other than by reducing crashes. Deaths of motor vehicle occupants of all ages could be markedly reduced by greater implementation of long available crash-packaging technologies, and by cleaning up highway and roadside hazards (Haddon,

1980; Haddon and Baker, 1981; Insurance Institute for Highway Safety, 1981). Restraints that work automatically in crashes, such as air bags, appear to be particularly needed by teenaged drivers. Seat belts which must be manually fastened are used by few drivers of any age, but their use by teenaged drivers is much lower than among older drivers (Williams, et al., 1982); and teenaged drivers are much less likely to increase their use of belts in response to laws requiring belt use (Robertson, 1978; Nordentoft, et al., 1978).

It is likely that the deaths that result from teenagers driving could be most effectively reduced by adopting policies that reduce their exposure as drivers, and by ensuring that long proven automatic injury-reduction technologies such as antiburst door locks, far more effective energy absorbing steering columns (Gloyns, et al., 1982), and airbags become standard equipment in all motor vehicles. To continue to tolerate these deaths without maximum effort on the part of all concerned to reduce them is to perpetuate carnage that should shock the conscience of a civilized country.

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Table 1. Actions or Conditions of Drivers on Which Assignments of Probable Responsibility for Two Passenger-Vehicle Crashes Were Based

Driver Action or Condition	Percent of Probably Responsible Drivers
Failure to keep in proper lane, or running off road	17
Failure to yield right of way	17
Driving too fast for conditions or in excess of posted maximum	17
Driving on wrong side of road	13
Operating the vehicle in an erratic, reckless, careless or negligent manner	10
Failure to obey traffic signs, traffic control devices or traffic officers	9
Inattentive (talking, eating, etc.)	5
Passing with insufficient distance or inadequate visibility or failing to yield to overtaking vehicles	2
Making improper turn	2
Driving wrong way on one-way roadway	1
Drowsy, sleepy, asleep, fatigued	1
Passing where prohibited	1
Following improperly	1
Improper or erratic lane changing	1
28 other actions or conditions	3
	100

Table 2. Probable Driver Responsibility in Two Passenger-Vehicle Crashes

Probable Driver Responsibility	N	%
Only one responsible	7819	85
Both responsible	671	7
Neither responsible	213	2
Responsibility unknown for one or both	488	6
Total	9191	100

Table 3. Numbers of Fatal Crashes for Which Drivers were Probably Responsible by Driver Age and Sex, United States, 1978*.

	Two-Vehicle Crashes						Two-Vehicle Crashes Plus Single Vehicle Crashes					
Driver Age	MALE N	%	FEMALE N	%	TOTAL N	%	MALE N	%	FEMALE N	%	TOTAL N	%
16	269	73	68	61	337	70	702	88	167	79	869	86
17	379	69	98	62	477	67	1039	86	212	78	1251	84
18	492	64	85	45	577	60	1272	82	227	69	1499	80
19	451	65	84	48	535	61	1284	84	223	71	1507	82
20-24	1575	58	342	46	1917	56	4658	80	890	69	5548	78
25-29	959	52	228	43	1187	50	2661	75	529	63	3190	73
30-39	990	45	280	43	1270	44	2740	69	655	63	3395	68
40-49	624	43	176	44	800	43	1588	66	377	62	1965	65
50-59	498	43	168	43	666	43	1262	65	362	62	1624	65
60-64	201	42	85	51	286	44	470	63	153	65	623	63
65-69	194	52	88	63	282	55	418	70	162	76	580	71
70+	550	70	213	78	763	72	899	79	303	83	1202	80

* Drivers in 488 crashes in which responsibility was unknown for one or both drivers are excluded.

Table 4. Numbers of Deaths for Which Drivers were Probably Responsible by Driver Age and Sex, United States, 1978*.

Driver Age	MALE N	MALE %	FEMALE N	FEMALE %	TOTAL N	TOTAL %
16	826	86	194	78	1020	85
17	1256	85	248	78	1504	84
18	1535	82	262	67	1797	79
19	1515	83	250	68	1765	81
20-24	5517	79	1023	68	6540	77
25-29	3166	74	615	62	3781	72
30-39	3128	67	767	62	3895	66
40-49	1820	64	431	60	2251	63
50-59	1429	63	413	60	1842	62
60-64	529	61	173	63	702	61
65-69	479	67	184	73	663	69
70+	994	76	339	82	1333	78

*Excludes the deaths in 488 crashes in which responsibility was unknown for one or both drivers, and 671 crashes in which both drivers were responsible; i.e., crashes in which there was shared responsibility.

Table 5. Deaths Per 100,000 License Holders, by Driver Age and Sex, United States, 1978.

	All Deaths			Deaths Responsible For			Deaths Not Responsible For		
Driver Age	M	F	Tot	M	F	Tot	M	F	Tot
16	90	29	63	78	23	53	12	6	10
17	90	24	61	77	19	51	13	5	10
18	103	26	68	84	17	54	19	8	14
19	93	22	60	78	15	49	15	7	12
20-24	70	17	45	55	12	35	14	5	10
25-29	45	12	29	33	7	21	12	4	8
30-39	31	9	20	21	6	14	10	3	7
40-49	26	7	17	16	4	11	9	3	6
50-59	21	8	15	13	4	9	8	3	6
60-64	20	8	14	12	5	9	8	3	6
65-69	37	15	28	28	12	21	9	3	6
70+	27	13	21	20	11	16	6	2	5

*Excludes the deaths in 488 crashes in which responsibility was unknown for one or both drivers, and 671 crashes in which both drivers were responsible; i.e., crashes in which there was shared responsibility.

Figure 1: Percent of Fatal Crashes Involving Drivers of Various Ages for which the Driver was Probably Responsible

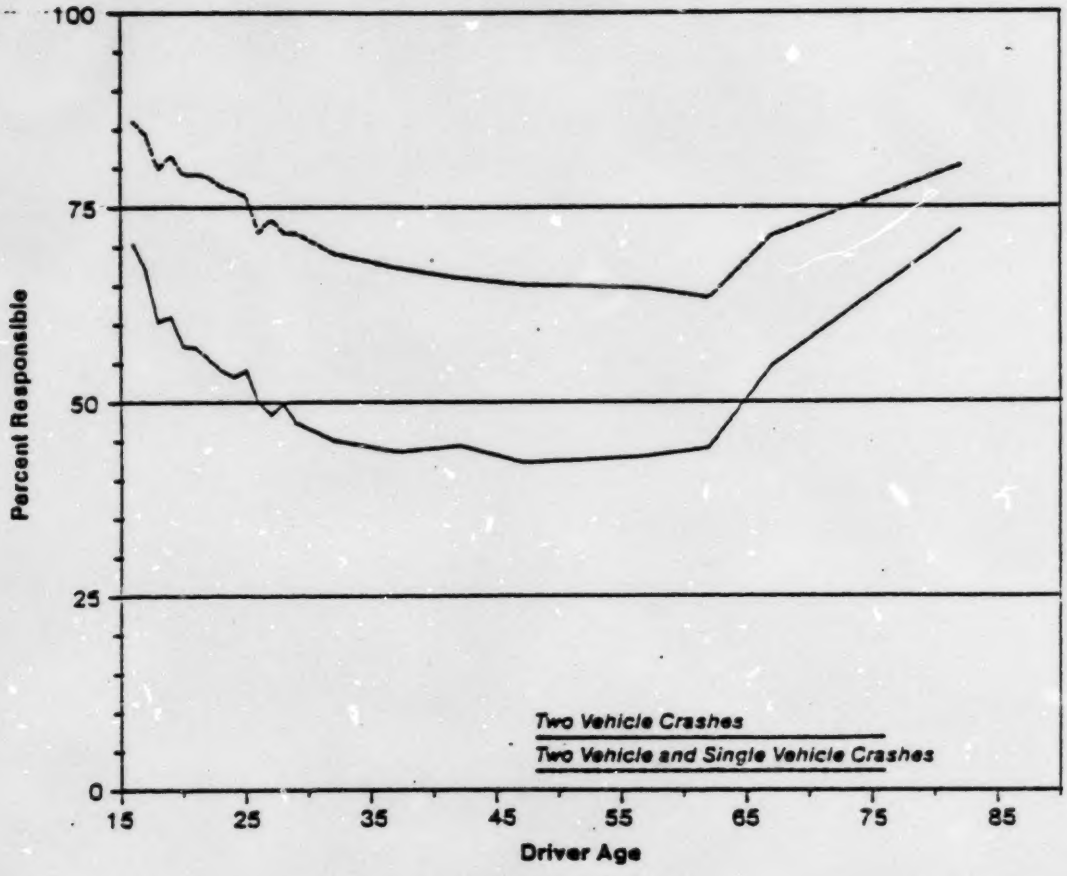

Figure 2: Percent of Fatal Crashes Involving Drivers of Various Ages for which the Driver was Probably Responsible, by Driver Sex

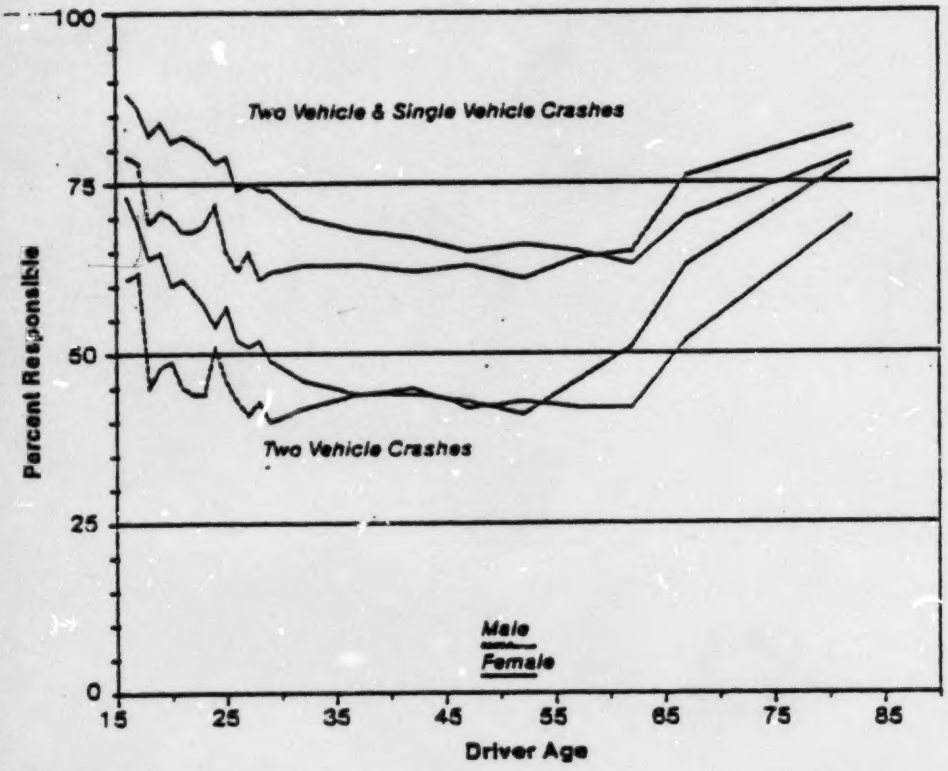

Figure 3: Percent of 16 Year Old Male Drivers in Two Vehicle Fatal Crashes Who Were Probably Responsible for the Crash, by Age of the Other Drivers

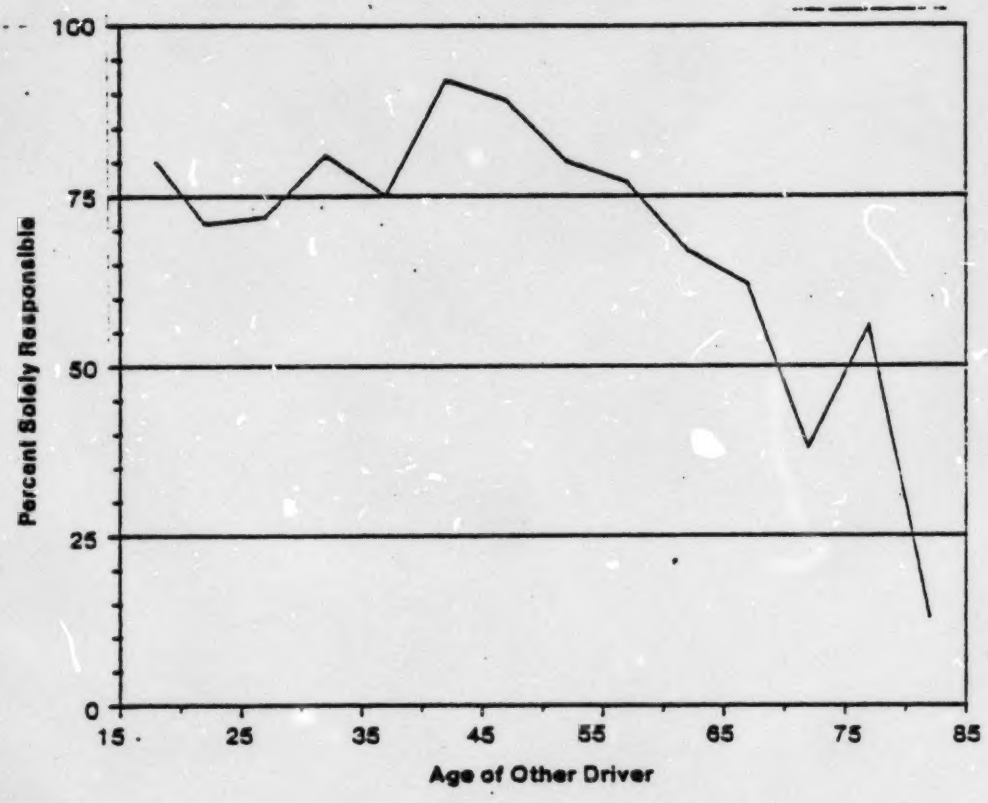

Figure 4: Percent of the Deaths Occurring in Crashes in Which Drivers of Various Ages were Involved for which they were Probably Responsible, by Driver Sex

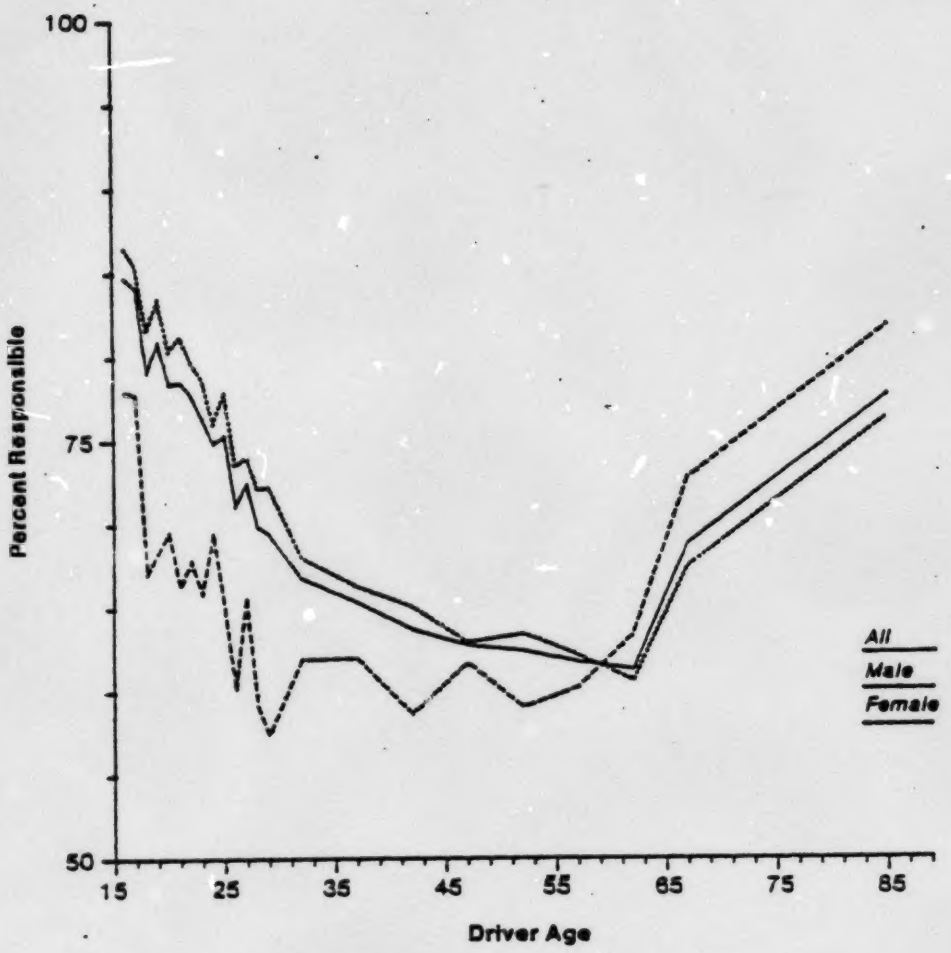

Figure 5: Deaths Per 100,000 Male License Holders, 1978

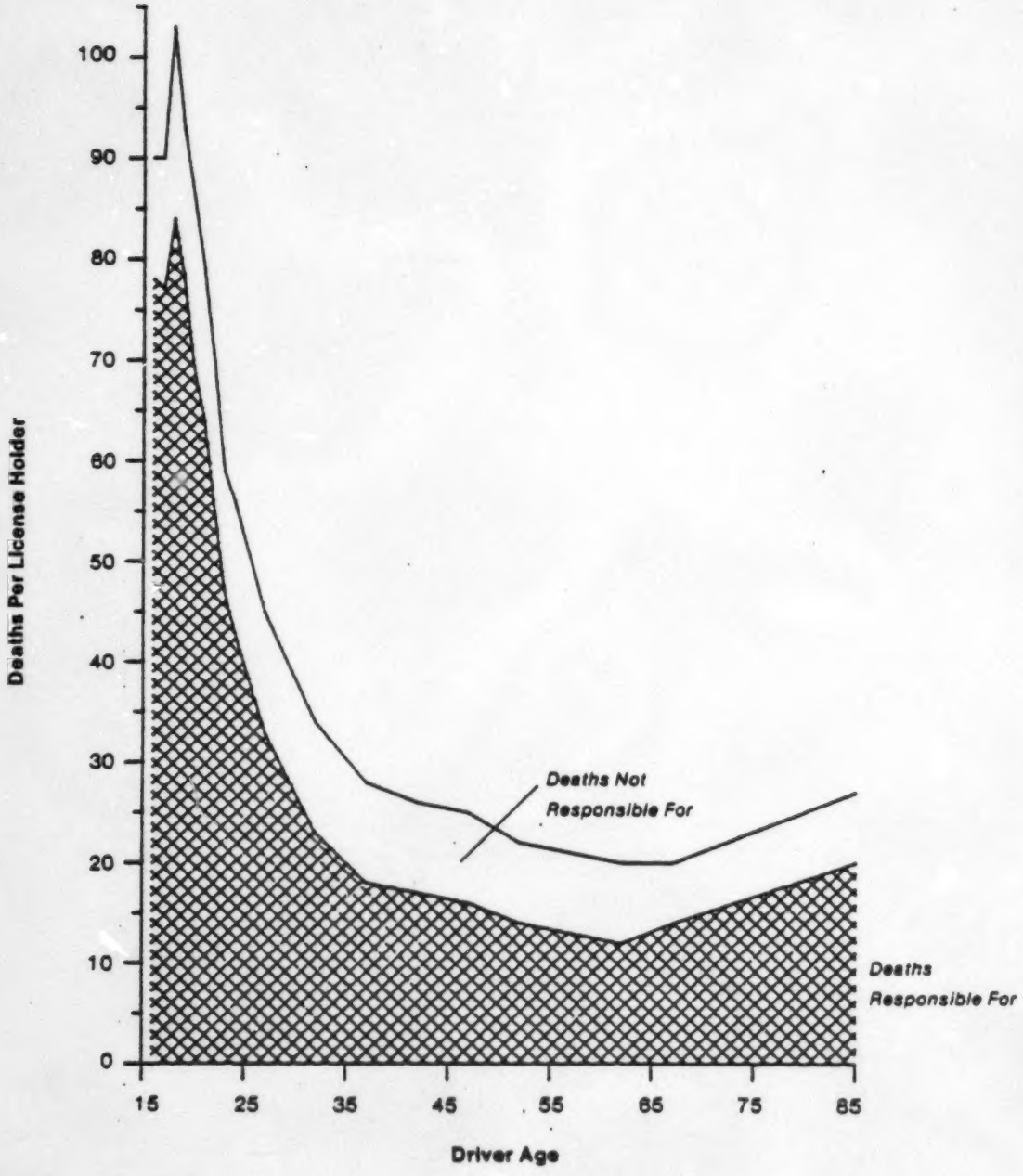

Figure 6: Deaths Per 100,000 Female License Holders, 1978

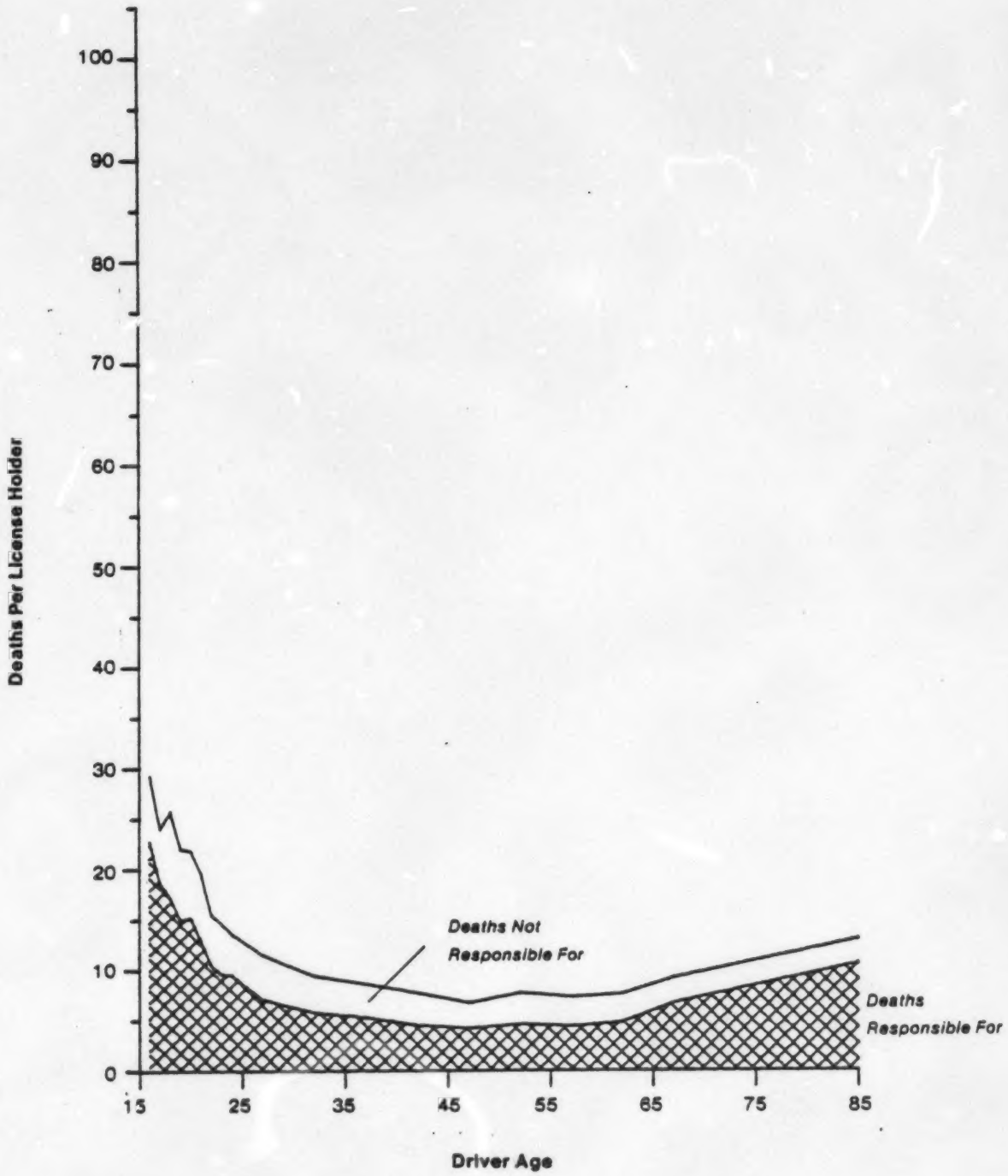

Figure 7: Percent of Crash Deaths for Which Drivers of Various Ages Were Probably Responsible That Were Sustained by People Other Than Themselves